CLAIMS

1. Apparatus for exercise and/or rehabilitation of neck extensors by flexion and extension movements, said apparatus comprising an equipment frame (1), a seat (2) provided with a back rest (3), and holding means (4) for holding a person's body substantially immobile in position relative to the back rest; a link rod (5) pivoted by its first end (6) on the equipment frame via a first joint (7) permitting a turning motion about a swing axis (8) perpendicular to the vertical middle plane of the seat; a head rest (9) functionally connected to the link rod (5) so that the link rod participates in turning the head rest during an exercise movement while the person's head is leaning against the head rest, and a resistance means (10) for generating a force opposing the exercise movement, characterised in that the apparatus comprises adjusting elements (11) for adjustment of the position of the seat in relation to the equipment frame (1); that the head rest (9) is substantially fitted to receive the upper part of the person's neck, preferably the area of the topmost two cervical vertebrae; that the apparatus comprises a multi-joint angular linkage mechanism (12), of which the link rod (5) constitutes a part, said multi-joint angular linkage mechanism (12) being connected to the head rest (9) so as to cause it to move during an exercise movement along a curved path that substantially coincides with the natural path of the neck during flexion and extension movements of the neck without producing any relative motion between the head rest (9) and the point of contact between the neck and the head rest (9).

2. Apparatus as defined in claim 1, characterised in that the movement of the head rest (9) follows a path of varying radius, such as an elliptical path.

3. Apparatus as defined in claim 1 ~~or 2~~, characterised in that the multi-joint angular linkage mechanism (12) is functionally a so-called five-joint planar mechanism, that the apparatus comprises a control gear (13) for controlling the motion of the multi-joint angular linkage mechanism; that the control gear (13) is rotatable about a swing axis (14) immovable with respect to the equipment frame (1); and that the swing axis (14) is disposed at a distance from the first joint (7) but in its vicinity.

4. Apparatus as defined in ~~any one of~~ claims 1 ~~1~~ 3, characterised in that the apparatus comprises an auxiliary link rod (15), whose first end is pivotally mounted on the equipment frame (1) via a second joint (17) disposed at a distance from the first joint (7) but in its vicinity; and a head rest support (18) to which the head rest (9) is attached, the second end (19) of the auxiliary link rod (15) being pivoted on said head rest support via a third joint (20); that the control gear (13) comprises a first frame component (21), which is rotatably mounted on the equipment frame (1) and provided with a first guide (22) disposed at a distance from the centre of rotation of the first frame component (21), and a second frame component (23), which is provided with a second guide (24), forming a guide pair with the first guide, permitting movement of the second frame component in a direction determined by the guides in relation to the first frame component; that the head rest support (18) is pivoted on the second frame component (23) via a fourth joint (25) disposed at a distance from the third joint (20); that the second end (26) of the link rod (5) is pivoted on the second frame component (23) via a fifth joint (27) disposed at a distance from the third joint and the fourth joint, the five-joint planar mechanism thus consisting of the rigid parts of the mechanism and equipment frame

between the first, second, third, fourth and fifth joints.

5. Apparatus as defined in claim 4, characterised in that the link rod (5) comprises second adjusting elements (28) to allow adjustment of the distance between the first joint (7) and the fifth joint (27).

6. Apparatus as defined in claim 4 ~~or 5~~, characterised in that the auxiliary link rod (15) comprises third adjusting elements (29) to allow adjustment of the distance between the second joint (17) and the third joint (20).

7. Apparatus as defined in ~~any one of~~ claims 1 ~~- 6~~, characterised in that the resistance means (10) has been fitted to oppose the turning motion of the link rod (5) and/or auxiliary link rod (15).

8. Apparatus as defined in ~~any one of~~ claims 1 ~~- 6~~, characterised in that the apparatus comprises a turning arbor (30) rotatably mounted with bearings on the equipment frame (1); that the first frame component (21) is attached to the turning arbor (30); and that the resistance means (10) is connected to the turning arbor (30) to generate a torque opposing the rotation of the turning arbor.

9. Apparatus as defined in claim 8, characterised in that the resistance means (10) works on a gravity resistance principle; and that the resistance means comprises a counterweight (31) consisting of a number of individual weight elements (32) of a given weight, which can be combined so as to create a predetermined load.

10. Apparatus as defined in claim 9, characterised in that the resistance means (10) comprises an eccentric gear (33) connected to the turning arbor (30) and comprising an eccentric surface (34) or the like; and a flexible elongated draw element (35) connected to the counterweight (31) and, on the other

hand, arranged in functional contact with the eccentric surface or the like, so that, as the draw element is wound around the eccentric surface or the like, a load opposing the exercise movement with a force that varies in a predetermined manner as a function of the rotational angle of the turning arbor.

11. Apparatus as defined in ~~any one of~~ claims ~~4 - 10,~~ characterised in that the first frame component (21) comprises a balancing counterweight (36) for balancing the structural assembly rotating about the swing axis (14).

12. Apparatus as defined in claim 11, characterised in that the first frame component (21) comprises fourth adjusting elements (37) to allow adjustment of the distance of the balancing counterweight (36) from the swing axis (14).